H.W.2 -- Comp 605

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Problem: Matrix Multiplication using Pthreads and calculating speed up for thread 1, 2, 4, 8, 16, 32.

Program O/P:

Following table displays the time taken by "mat-mat.c" with different number of threads and time display is in seconds. I have round up the results to nearest integer values to make "Speed Up" computation easier. Speed up in computed with respect to time taken by one thread (i.e. serial matrix multiplication) and is reported in percentage.
For Eg:

- Time taken - 1 thread = 881 sec (round up) [Serial computation]
- Time taken - 2 threads = 341 sec (round up) [Parallel computation]

Speed Up = Time Serial Comp / Time Parallel Comp * 100
Speed Up = 14/5.6 * 100 = 250 %

No of Threads	Time Taken (sec)	Time Taken (min)	Speed Up (%)
1	844	14	-
2	341	5.6	250
4	207	3.45	405
8	113	1.8	777
16	60	1	1400
32	43	0.7	2000

Program Compilation O/P:

I ran my code with -Wall and -Werror flag and neither the errors nor there warnings were generated.

```
[singh@tuckoo hw2]$ gcc -Wall -Werror -o mat-mat mat-mat.c -lpthread
[singh@tuckoo hw2]$
```

Valgrind O/P:

Output for memory leaks. All memory was freed – no leaks were found.

```
File  Edit  View  Bookmarks  Settings  Help
[singh@tuckoo hw2]$ valgrind --tool=memcheck --leak-check=yes ./mat-mat
==17299== Memcheck, a memory error detector
==17299== Copyright (C) 2002-2012, and GNU GPL'd, by Julian Seward et al.
==17299== Using Valgrind-3.8.1 and LibVEX; rerun with -h for copyright info
==17299== Command: ./mat-mat
==17299==
./mat-mat <number of threads>
==17299==
==17299== HEAP SUMMARY:
==17299==     in use at exit: 0 bytes in 0 blocks
==17299==   total heap usage: 0 allocs, 0 frees, 0 bytes allocated
==17299==
==17299== All heap blocks were freed -- no leaks are possible
==17299==
==17299== For counts of detected and suppressed errors, rerun with: -v
==17299== ERROR SUMMARY: 0 errors from 0 contexts (suppressed: 6 from 6)
[singh@tuckoo hw2]$
```